

REMARKS

The foregoing amendment amends the specification, Figures 11 and 12, and claims 1 and 2. Pending in the application are claims 1-5, of which claim 1 is independent. The following comments address all stated grounds for rejection and place the presently pending claims, as identified above, in condition for allowance.

Claim 1 is amended to specify that the anode electrode is separate from the first gas diffusion layer, and is located closer to the solid polymer electrolyte membrane. Claim 1 also specifies that the cathode electrode is separate from the second gas diffusion layer and is located closer to the solid polymer electrolyte membrane. Support for the amendment can be found throughout the original specification and figures, including, for example, page 6, lines 13-22 and Figure 1.

Claim 2 is amended to change the word "projection" --projecting portion-- in line 5.
No new matter is added.

Amendment and cancellation of the claims are not to be construed as an acquiescence to any of the objections/rejections set forth in the instant Office Action, and were done solely to expedite prosecution of the application. Applicants reserve the right to pursue the claims as originally filed, or similar claims, in this or one or more subsequent patent applications.

Objection to the Drawings

Regarding the objections to the drawings, Applicants submit herewith one (1) replacement drawing sheet including changes to Figures 11 and 12. As requested by the Examiner, Figures 11 and 12 have been amended to include a ---Prior Art--- designation.

Applicants have also amended the specification to comply with the Figures. Specifically, Applicants have amended paragraph [0011] of the specification (page 3, paragraph 3) to include a "C" after "space" to be consistent with Figure 12. Applicants also amend paragraph [0045] of the specification (page 9, paragraph 4) to change the reference number "70a" to ---40a---, consistent with what is shown in Figures 1-5. As Applicants have addressed all outstanding objections to the Figures, it is respectfully submitted that the Figures are now in condition for acceptance by the Examiner.

Rejection under 35 U.S.C. 112

Regarding the rejection of claim 2 under 35 U.S.C. 112, as being indefinite, Applicants have amended claim 2 to change the recitation "the projection" to ---the projecting portion---, which has antecedent basis in line 2. Applicants respectfully request that the rejection of claim 2 under 35 U.S.C. 112 be reconsidered and withdrawn.

Double Patenting Rejection

Regarding the rejection of claims 1-2 and 5 under the doctrine of obviousness-type double patenting over claims 1-2 and 5 of co-pending Patent Application Serial No. 09/847,895, Applicants have amended claim 1 to distinguish over the claims of co-pending Patent Application Serial No. 09/847,895, and request that the rejection be reconsidered and withdrawn. Specifically, claim 1 of the present application now recites that the anode electrode is separate from the first gas diffusion layer and located closer to the solid polymer electrolyte membrane. Amended claim 1 also specifies that the cathode electrode is separate from the second gas diffusion layer and is located closer to the solid polymer membrane. This feature is not recited in or obvious from the claims of co-pending Patent Application Serial No. 09/847,895.

Art Rejections

In the Office Action, the Examiner rejects claims 1-4 under 35 U.S.C. 102(b) as being anticipated by Jones U.S. Patent Number 6,007,933. The Examiner also rejects claim 5 under 35 U.S.C. 103(a) as being unpatentable over the Jones reference in view of Japanese publication JP 08-148169. Applicants respectfully traverse the rejection and submit that the pending claims 1-5, as identified above, are patentable over the cited references.

Regarding the rejection of claim 1 as being anticipated by the Jones reference, amended claim 1 is patentable over the Jones reference, because the Jones reference does not teach or suggest all of the limitations of claim 1. For example, the Jones reference does not teach or suggest a fuel cell including a membrane electrode assembly comprising an *anode* electrode that is separate from a first gas diffusion layer *and* located closer to the first gas diffusion layer and a solid polymer electrolyte membrane, as recited in claim 1. The Jones reference also does not teach or suggest a fuel cell including a membrane electrode assembly wherein a *cathode* electrode is separate from a second gas diffusion layer and located closer to the second gas diffusion layer and a solid polymer electrolyte membrane, as also recited in

claim 1. In an illustrative embodiment of the present invention, the location of the electrodes relative to the solid polymer electrolyte membrane improves the efficiency of the electric power generation of the fuel cell.

The Jones reference describes a fuel cell assembly including a fluid flow plate having an open-faced flow channel formed therein for providing fluid to a membrane electrode assembly, and a gas diffusion layer located *between* the fluid flow plate and the membrane electrode assembly. As clearly shown in Figure 3, the anode electrode, which is described as being formed in the fluid flow plate 200, is located on an outer surface of the first gas diffusion layer 312, i.e., farther from, rather than closer to, the solid polymer electrolyte 306. (See column 6, lines 44-55.) In Jones, the *first gas diffusion layer* 312 is closer to the solid polymer electrolyte 306 than the anode electrode 202. The second gas diffusion layer 312' is located between a cathode electrode 202', which is described as being formed in the flow field plate 200', and the solid polymer electrolyte 306. As clearly shown, the cathode electrode 202' is *farther* from, not closer to, as recited in claim 1, the solid polymer electrolyte 306 than the second gas diffusion layer. Therefore, the Jones reference fails to anticipate claim 1.

According to the Examiner, in paragraph 10 of the Office Action, the recitation of a "diffusion electrode" inherently includes an anode or cathode electrode and a gas diffusion layer. However, in Jones, if the anode side gas diffusion layer (312) did include an anode electrode and if the cathode side diffusion layer (312') did include a cathode electrode, the gas diffusion layers (312, 312') and their respective electrodes would have to be provided in one piece would therefore be inseparable. In contrast, claim 1 specifically recites that the anode electrode is separate from the first gas diffusion layer and the cathode electrode is separate from the second gas diffusion layer, as clearly shown in Figure 1.

Regarding the Examiner's note regarding the recitation that the seal was *liquid sealant at the time of application* is interpreted as a solid seal, Applicants respectfully submit that claim 1 is directed to a fuel cell including a seal formed of a certain material having selected properties and capabilities, not to a solid seal per se. The recitation is intended to specify that the seal is formed of a material that can be applied in liquid form, a feature neither taught nor suggested in the cited references. The recitation is not directed to the final state of the seal, as alleged by the Examiner, but rather, to the type of material used to form the seal, i.e., a

material, such as, but not limited to, a thermosetting fluorine-containing material or thermosetting silicon, which is capable of being applied to a fuel cell in liquid form. The material for the seal may be applied in the form of a *liquid* sealant to grooves in a separator of the fuel cell.

In contrast, the gasketing material described in the Jones reference is a polytetrafluoroethylene material, which is not a *thermosetting* fluorine-containing material. The polytetrafluoroethylene material used to form the gaskets in Jones is not capable of being applied to a fuel cell separator in liquid form. Rather, the gaskets 304 and 304' of Jones are *solid* at all times, including during application and assembly of the fuel cell.

As set forth, the Jones reference does not teach or suggest a fuel cell having an electrode that is separate from a gas diffusion layer, and closer to a membrane, as recited in claim 1. The Jones reference also does not teach or suggest a seal in a fuel cell formed of a material that is capable of being applied to a separator of the fuel cell in liquid form, as also recited in claim 1. The JP 08-148169 does not compensate for the deficiencies of the Jones reference. For at least these reasons, independent claim 1 is patentable over the cited references.

Regarding the rejection of claims 2-5, as set forth above, independent claim 1, from which claims 2-5 depend, is patentable over the Jones reference. Therefore, dependent claims 2-5 are also patentable over the Jones reference.

Information Disclosure Statement

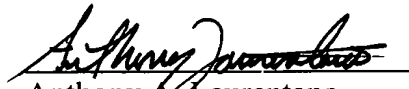
Applicants submit herewith a Supplemental Information Disclosure Statement to make European Patent Application Number 99115250.5, International Publication Number WO 02/23656 and International Publication Number WO 98/33221 of record during the prosecution of the above-referenced patent application. Applicants do not consider the cited references to detract from the patentability of the pending claims, as the cited references do not teach or suggest the claimed invention.

CONCLUSION

In view of the foregoing, favorable reconsideration and withdrawal of all the rejections, and allowance of the instant application with all pending claims are respectfully solicited. If there are any remaining issues, an opportunity for an interview is requested prior to the issuance of another Office Action. If the above amendments are not deemed to place this case in condition for allowance, the Examiner is urged to call the Applicant's representative at the telephone number listed below.

Respectfully submitted,

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Date: **September 4, 2003**